

Appl. No. 09/973,285  
Amdt. Dated March 29, 2007  
Reply to Office Action of November 29, 2006

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•• REMARKS/ARGUMENTS ••

The Office Action of November 29, 2006 has been thoroughly reviewed. Accordingly, the following remarks are believed to be sufficient to place the application into condition for allowance.

Claims 1-11, 14 and 15 are pending in the present application.

Claims 1-6, 8-11, 14 and 15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over UK Patent Application No. 2,086,243 to Fuscone et al. in view of "what is known to one of ordinary skill in the art.

Claim 7 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Fuscone et al. in view of U.S. Patent No. 4,768,789 to Clark.

The Examiner has relied upon Fuscone et al as disclosing:

...an electric dart game comprising a dart (Fig. 1), a dartboard provided with a frame of a plurality of scoring areas by a plurality of radial spiders and circumferential spiders which are arranged crossly (Fig. 2, 7 and 9), with a main body for receiving said dart and attached to said frame, and an electronic scoring means for displaying signals collected from the scoring areas (Fig. 5). Said scoring system uses a plurality of inductance coils (Fig. 1 and page 1, lines 125-129 connected to the electronic scoring system (Fig. 5). Fuscone discloses said dart is made of, thus provided with, a magnetic substance (page 1, lines 75-78, 103). Each of said coils is associated with a corresponding scoring area and thus defines a scoring signal zone (Fig. 2). When said dart is thrown at said dartboard, a scoring signal is generated by said dart entering said signal zone and is transmitted to said scoring system (page 2, lines 20-24, 66-82).

"Regarding the limitation that the induction coil be coreless," the Examiner states:

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...the purpose of providing the iron core in the inductor is to concentrate the effect of any magnetic field within the center of the induction coil (within the iron cores). However, as is well known by one of ordinary skill in the art, an inductor in its simplest form is a conductive wire formed in the shape of a loop or coil, and will create the magnetic field inside the coil without the presence of the core.

The Examiner concludes:

Therefore, the inclusion of iron cores in the inductors disclosed by Fuscone is not necessary, as the inductor would still perform the necessary function of creating a magnetic field with in the center of the induction coil with or without the iron core, albeit the magnetic field would not have been as concentrated as had the iron core been in place.

The Examiner further states:

If the claims are given their broadest reasonable interpretation, the limitation of "a plurality of coreless induction coils with predetermined turns, provided with said frame and connected to said electronic scoring means", wherein "each of said coreless induction coils is associated with a corresponding on [sic] of said scoring areas and defines a scoring signal zone" is met by the invention disclosed by Fuscone, under the assertion that coreless induction coils is a matter of design choice and would have been obvious to one of ordinary skill in the art at the time of the invention.

The Examiner also states:

One would have been motivated to remove the core from the induction coil for any application that requires a small amount of induction as in said dartboard to reduce the weight of the apparatus and lower manufacturing costs.

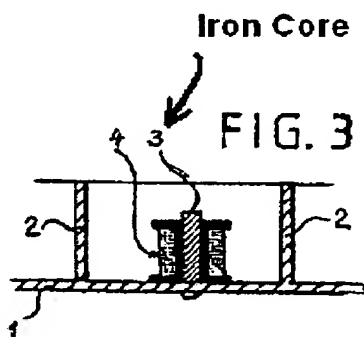
The undersigned respectfully submits that the Examiner's position is unsupported by the prior art and patent case law and is improper.

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First, it is noted that magnetic permeability is related in physical terms most closely to electric permittivity. It is probably easier to think of permeability as representing "conductivity for magnetic flux"; just as those materials with high electrical conductivity let electric current through easily so materials with high permeabilities allow magnetic flux through more easily than others. Materials with high permeabilities include iron and the other ferromagnetic materials. Most plastics, wood, non ferrous metals, air and other fluids have permeabilities very much lower:  $\mu_0$ .

Thus, it is submitted that a dartboard made of out a conventional material such as that of Fuscone et al. actually insulates magnetic flux from passing therethrough. This insulating effect increases with thickness.

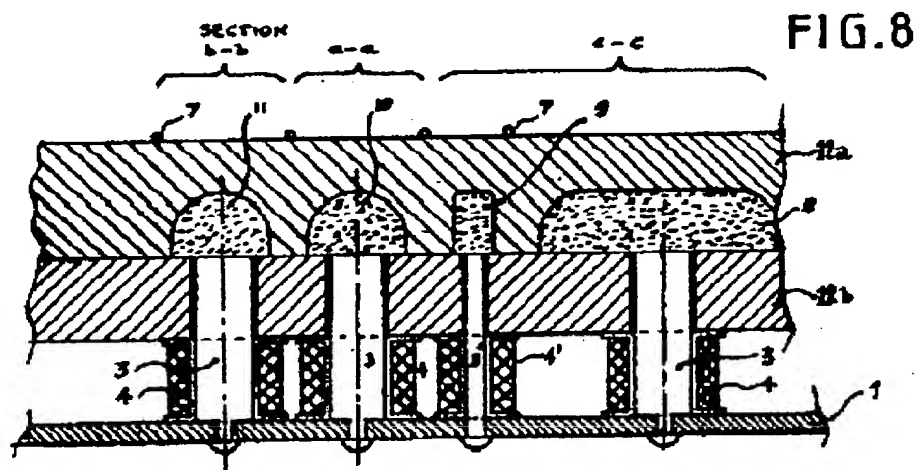
Figure 3 of Fuscone et al. is presented as follows:



It is noted that Fig. 3 is stated to "show portions of the rear sensor assembly" and "is an elevation of the sensor assembly as viewed from the rear surface of the dart board (looking in the direction towards the wall behind)."

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What the Examiner might not appreciate from reviewing Fig. 2 of Fuscone et al. is that this figure does not show the actual dart board into which a dart can be embedded. For this the Examiner is referred to Fig. 8 of Fuscone et al. and particularly the "board" which "consists of two plates, 12a and 12b, which are bonded together.



Further the Examiner will note that circular bottom plate 1 in Fig. 8 corresponds to the circular bottom plate in Fig. 2.

It is submitted that a full cross-sectional view of the embodiment of Fig. 2 of Fuscone et al. would necessarily show a "board" structure which would necessarily be similar to the "board" shown in Fig. 8, including a first layer ("target board") that is formed of a material that will allow the tip of a dart to penetrate and a second reinforcing forcing ("reinforcement board").

This necessarily "board" would create an insulating effect which would limit the ability of magnetic flux to penetrate and pass through the "board."

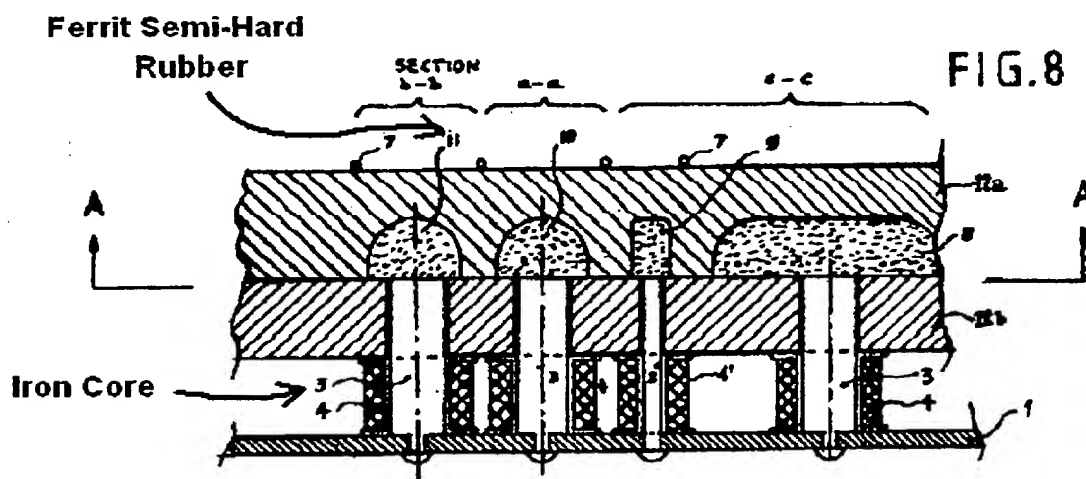
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Accordingly, Fuscone et al. has found it necessary to provide iron cores in the induction coils for the purpose of concentrating concentrates the effect of any magnetic field within the center of the induction coil (within the iron coils).

In recognizing that the "board" has a low magnetic permeability which results in small induced signals (even when iron cores are used), Fuscone et al. has developed the embodiment of Fig. 8 which again is presented as follows:



This embodiment, which is stated as having been developed to "increase the input difference signals" by making the scoring sectors "magnetically conductive" and is "ideally the full board depth [is] made magnetically permeable."

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Specifically, the embodiment of Fig. 8 of Fuscone et al. is provided with ferrit semi-hard rubber- filled recesses which provide "good magnetic susceptibility." In addition, the iron cores of the induction core are extended so that they "touch the magnetic rubber fillings."

It is thus clear that:

1) Fuscone et al. teaches that the iron cores are necessary (do to the configuration and characteristics of the overlying "board" for each embodiment, and

2) In order to compensate for the magnetic field insulation effect of the "board," the combination of magnetic rubber fillings and extended iron cores are required.

From these teachings of Fuscone et al., it cannot be said that it would have at all been obvious to modify Fuscone et al. by eliminating the iron cores.

Doing so, that is eliminating the iron cores, goes directly against the teachings of Fuscone et al. and would clearly degrade the functioning of Fuscone et al.

Under the holding of the Board of Patent Appeals and Interferences in *Ex parte Hartmann*, 186 USPQ 366 (PTO Bd App 1974) such a modification would clearly be improper.

The Examiner's stated motivation - to reduce the weight of the apparatus and lower manufacturing costs - does not compensate for the degradation to the functioning of Fuscone et al, which would result in the proposed modification.

The Examiner's reliance upon Clark does not address or overcome the distinctions between the present invention and Fuscone et al.

Based upon the above distinctions between the prior art relied upon by the Examiner and the present invention, and the overall teachings of prior art, properly considered as a whole, it is

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respectfully submitted that the Examiner cannot rely upon the prior art as required under 35 U.S.C. §103 to establish a prima facie case of obviousness of applicant's claimed invention.

It is, therefore, submitted that any reliance upon prior art would be improper inasmuch as the prior art does not remotely anticipate, teach, suggest or render obvious the present invention.

It is submitted that the claims, as now amended, and the discussion contained herein clearly show that the claimed invention is novel and neither anticipated nor obvious over the teachings of the prior art and the outstanding rejection of the claims should hence be withdrawn.

Therefore, reconsideration and withdrawal of the outstanding rejection of the claims and an early allowance of the claims is believed to be in order.

It is believed that the above represents a complete response to the outstanding Official Action and reconsideration is requested.

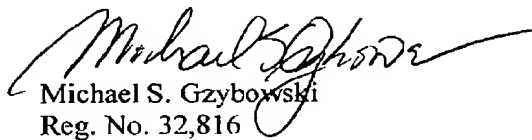
If upon consideration of the above, the Examiner should feel that there remain outstanding issues in the present application that could be resolved, the Examiner is invited to contact applicant's patent counsel at the telephone number given below to discuss such issues.

To the extent necessary, a petition for an extension of time under 37 CFR §1.136 is hereby made. Please charge the fees due in connection with the filing of this paper, including

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extension of time fees, to Deposit Account No. 12-2136 and please credit any excess fees to such deposit account.

Respectfully submitted,



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